

=> FILE REG
FILE 'REGISTRY' ENTERED AT 19:33:14 ON 16 DEC 2008
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=> DISPLAY HISTORY FULL L1-

FILE 'REGISTRY' ENTERED AT 19:13:35 ON 16 DEC 2008
E SULFURIC ACID/CN
L1 1 SEA "SULFURIC ACID"/CN
E SULFUR DIOXIDE/CN
L2 1 SEA "SULFUR DIOXIDE"/CN
E OXYGEN/CN
L3 1 SEA OXYGEN/CN
E SULFUR TRIOXIDE/CN
L4 1 SEA "SULFUR TRIOXIDE"/CN

FILE 'HCA' ENTERED AT 19:20:59 ON 16 DEC 2008
L5 12490 SEA L1/P
L6 10959 SEA L2 (L) RACT/RL
L7 63736 SEA L3 (L) RACT/RL
L8 43002 SEA L4 OR (SULFUR# OR SULPHUR# OR SULFER# OR SULPHER#) (W)
TRIOXIDE# OR SO3
L9 77860 SEA UPSTREAM?
L10 1357 SEA CONTACT?(2A)(STAGE# OR STAGING#)
L11 7891 SEA (MAIN# OR PRIMAR? OR PRINCIPAL?) (2A)(CONTACT? OR
STAGE# OR STAGING#)
L12 1310206 SEA ABSORB? OR ABSORP?
L13 25186 SEA (GAS## OR GASEOUS? OR GASIF?) (2A)(FED OR FEED?) OR
FEEDGAS?
L14 170 SEA PRECONTACT? OR PRE(W)CONTACT?
L15 1388 SEA DAUM ?/AU
L16 3953 SEA SEITZ ?/AU
L17 94065 SEA MULLER ?/AU OR MUELLER ?/AU
L18 68 SEA ANASTASIJEVIC ?/AU
L19 1 SEA L15 AND L16 AND L17 AND L18
L20 2962 SEA CONTACT?(2A)STEP?
L21 5881 SEA (MAIN# OR PRIMAR? OR PRINCIPAL?) (2A)STEP?
L22 35 SEA L5 AND L6 AND L7
L23 25 SEA L22 AND ((L8 OR L9 OR L10 OR L11 OR L12 OR L13) OR
L14 OR L20 OR L21)
SET ROLES TEXT
L24 10 SEA L22 NOT L23
L25 16 SEA 1808-2002/PY,PRY,AY AND L23

=> FILE HCA

FILE 'HCA' ENTERED AT 19:33:31 ON 16 DEC 2008
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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=> D L25 1-16 BIB ABS HITSTR HITIND

L25 ANSWER 1 OF 16 HCA COPYRIGHT 2008 ACS on STN
AN 140:359745 HCA Full-text
TI Procedure and device for the production of sulfuric acid from sulfur
dioxide-rich gases
IN Daum, Karl-Heinz; Mueller, Hermann; Seitz, Ekkehard; Anastasijevic,
Nikola
PA Outokumpu Oyj, Finland
SO Ger. Offen., 26 pp.
CODEN: GWXXBX

DT Patent
LA German

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|-------------|------|----------|------------------|--------------|
| | ----- | ---- | ----- | ----- | |
| PI | DE 10249782 | A1 | 20040506 | DE 2002-10249782 | 200210 24 |
| TW | 250125 | B | 20060301 | TW 2003-92128992 | 200310 20 |
| CA | 2503221 | A1 | 20040506 | CA 2003-2503221 | 200310 21 |
| WO | 2004037719 | A1 | 20040506 | WO 2003-EP11659 | 200310 21 |

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,

CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,
LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL,
SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA,
ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,
BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,
SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG

AU 2003274054 A1 20040513 AU 2003-274054
200310
21

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BR 2003015534 A 20050823 BR 2003-15534
200310
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EP 1565402 A1 20050824 EP 2003-758033
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PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,
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CN 1708453 A 20051214 CN 2003-80102005
200310
21

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JP 2006503782 T 20060202 JP 2004-545919
200310
21

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IN 2005MN00302 A 20051202 IN 2005-MN302
200504
19

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MX 2005PA04226 A 20050608 MX 2005-PA4226
200504
20

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US 20060245997 A1 20061102 US 2005-532326
200504
22

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PRAI DE 2002-10249782 A 20021024 <--

WO 2003-EP11659 W 20031021

AB H₂SO₄ is produced by (1) catalytic oxidn. of SO₂ with O₂ in >2 successively connected contact steps to give SO₃, and (2) absorption of the resulting SO₃ in an absorber. A partial flow contg. SO₂ and SO₃ is discharged from the last contact step followed by mixing the flow with a waste gas to obtain a contact gas contg. >13% SO₂ that is recycled into the first contact step.

IT 7664-93-9P, Sulfuric acid, preparation

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(procedure and plant for prodn. of sulfuric acid from sulfur dioxide-rich gases)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7, Oxygen, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(procedure and plant for prodn. of sulfuric acid from sulfur dioxide-rich gases)

RN 7446-09-5 HCA

CN Sulfur dioxide (CA INDEX NAME)



RN 7782-44-7 HCA

CN Oxygen (CA INDEX NAME)



IT 7446-11-9P, Sulfur trioxide, preparation

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(procedure and plant for prodn. of sulfuric acid from sulfur dioxide-rich gases)

RN 7446-11-9 HCA

CN Sulfur trioxide (CA INDEX NAME)



IC ICM C01B017-765
CC 49-2 (Industrial Inorganic Chemicals)
ST sulfuric acid prodn sulfur trioxide
absorption; sulfur dioxide catalytic oxidn oxygen
IT Oxidation
(catalytic; of sulfur dioxide in contact step
, for prodn. of sulfuric acid by)
IT Absorption
(of sulfur trioxide, for prodn. of sulfuric
acid from sulfur dioxide-rich gases)
IT 7664-93-9P, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
(Preparation)
(procedure and plant for prodn. of sulfuric acid from sulfur
dioxide-rich gases)
IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,
Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(procedure and plant for prodn. of sulfuric acid from sulfur
dioxide-rich gases)
IT 7446-11-9P, Sulfur trioxide, preparation
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
RACT (Reactant or reagent)
(procedure and plant for prodn. of sulfuric acid from sulfur
dioxide-rich gases)

L25 ANSWER 2 OF 16 HCA COPYRIGHT 2008 ACS on STN
AN 138:257330 HCA Full-text
TI Manufacture of oleum and sulfuric acid by low-temperature spray
combustion of sulfur
IN Eichenhofer, Kurt-Wilhelm; Grabowski, Klaus-Peter; Draeger, Guenter;
Kuerten, Martin; Schweitzer, Martin
PA Bayer AG, Germany
SO Ger. Offen., 12 pp.
CODEN: GWXXBX
DT Patent

LA German

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|--|------|----------|------------------|----------|
| PI | DE 10143176 | A1 | 20030320 | DE 2001-10143176 | 20010904 |
| | | | | <-- | |
| | EP 1295849 | A2 | 20030326 | EP 2002-18250 | 20020822 |
| | | | | <-- | |
| | EP 1295849 | A3 | 20031126 | | |
| | EP 1295849 | B1 | 20060712 | | |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK | | | | |
| | AT 332874 | T | 20060815 | AT 2002-18250 | 20020822 |
| | | | | | |
| | ES 2267906 | T3 | 20070316 | ES 2002-18250 | 20020822 |
| | | | | <-- | |
| | JP 2003089509 | A | 20030328 | JP 2002-250364 | 20020829 |
| | | | | <-- | |
| | US 20030077217 | A1 | 20030424 | US 2002-230835 | 20020829 |
| | | | | <-- | |
| | US 6893622 | B2 | 20050517 | | |
| | CA 2401263 | A1 | 20030304 | CA 2002-2401263 | 20020903 |
| | | | | <-- | |

PRAI DE 2001-10143176 A 20010904 <--

AB Oleum having a SO₃ concn. of 10-45 wt.% and 94-100 wt.% H₂SO₄ are produced by (1) hyper-stoichiometric combustion of S with atm. O₂, (2) cooling the resulting SO₂-contg. gases at 350°-500°, (3) catalytic conversion the cooled SO₂-contg. gases to SO₃-contg. gases in the presence of a V catalyst by single- or double-contact catalysis, (4) absorbing the SO₃-contg. gases after cooling, and (5) sepn. of liqs. and energy recovery. The liq. S is sprayed vertically in the hot combustion flow by using bimodal fan nozzles. The

disclosed method reduces the NOHSO_4 content and the serviceability costs caused by corrosion, and can be carrying out without $(\text{H}_2\text{NNH}_2)_2\text{H}_2\text{SO}_4$ soln.

IT 7446-09-5P, Sulfur dioxide, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); RCT (Reactant); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(for low-temp. combustion of sulfur for prodn. of oleum and sulfuric acid)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)

O=S=O

IT 7782-44-7, Oxygen, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(for low-temp. combustion of sulfur for prodn. of oleum and sulfuric acid)
RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)

O=O

IT 7664-93-9P, Sulfuric acid, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(manuf. of oleum and sulfuric acid by low-temp. spray combustion of sulfur)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IC ICM C01B017-69
 CC 49-2 (Industrial Inorganic Chemicals)
 IT 124-38-9P, Carbon dioxide, preparation 630-08-0P, Carbon monoxide, preparation
 7446-09-5P, Sulfur dioxide, preparation
 7727-37-9P, Nitrogen, preparation 11104-93-1P, NO_x, preparation
 RL: CPS (Chemical process); IMF (Industrial manufacture); PEP
 (Physical, engineering or chemical process); RCT (Reactant); PREP
 (Preparation); PROC (Process); RACT (Reactant or reagent)
 (for low-temp. combustion of sulfur for prodn. of oleum and
 sulfuric acid)
 IT 7782-44-7, Oxygen, reactions
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical
 process); RCT (Reactant); PROC (Process); RACT (Reactant or
 reagent)
 (for low-temp. combustion of sulfur for prodn. of oleum and
 sulfuric acid)
 IT 7664-93-9P, Sulfuric acid, preparation 8014-95-7P, Oleum
 RL: CPS (Chemical process); IMF (Industrial manufacture); PEP
 (Physical, engineering or chemical process); PREP (Preparation);
 PROC (Process)
 (manuf. of oleum and sulfuric acid by low-temp. spray combustion
 of sulfur)
 L25 ANSWER 3 OF 16 HCA COPYRIGHT 2008 ACS on STN
 AN 138:240027 HCA Full-text
 TI Process and plant for the conversion of SO₂ into sulfuric acid
 IN Fattinger, Volker; Jaeger, Walter
 PA Fattinger Air Pollution Control AG, Switz.
 SO S. Africam, 21 pp.
 CODEN: SFXXAB
 DT Patent
 LA English
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|------------|------|----------|-----------------|--------------|
| PI | ZA 9906661 | A | 20000515 | ZA 1999-6661 | 199910 22 |

<--

PRAI CH 1998-2147 A 19981023 <--
 AB To lower the manuf. cost and recover the discharge gases, a process
 combining a contact plant (KA) and a nitric oxide sulfuric acid plant
 (SSA) is provided for manuf. of highly concd. sulfuric acid by
 conversion of SO₂. Water in the feed gases and/or process air of the
 KA is absorbed with < 72% H₂SO₄ from the SSA, then, the water

absorbed < 65% H₂SO₄ is transferred to a SO₂ absorption stage of the SSA. The dried discharge gas contg. SO₂ and NO_x from the KA is fed into the SSA for the recovery of concd. H₂SO₄. The discharge gases contain (SO₂ and NO_x) <= 20 ppm.

IT 7664-93-9P, Sulphuric acid, preparation
RL: PNU (Preparation, unclassified); PREP (Preparation)
(process and plant for manuf. of concd. sulfuric acid)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for manuf. of concd. sulfuric acid)
RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for manuf. of concd. sulfuric acid)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



IC ICM B01D
ICS C01B
CC 49-2 (Industrial Inorganic Chemicals)
ST sulfuric acid oleum sulfur oxide conversion; water
absorption acid exchange discharge gas recovery
IT 11104-93-1, Nitrogen oxide, processes
RL: REM (Removal or disposal); PROC (Process)

(in feed gas for manuf. of concd. sulfuric acid)

IT 7732-18-5, Water, processes
 RL: REM (Removal or disposal); PROC (Process)
 (in feed gas removed for manuf. of concd. sulfuric acid)

IT 7664-93-9P, Sulphuric acid, preparation 8014-95-7P, Oleum
 RL: PNU (Preparation, unclassified); PREP (Preparation)
 (process and plant for manuf. of concd. sulfuric acid)

IT 7782-44-7, Oxygen, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reactant for manuf. of concd. sulfuric acid)

IT 7446-09-5, Sulfur dioxide, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reactant for manuf. of concd. sulfuric acid)

L25 ANSWER 4 OF 16 HCA COPYRIGHT 2008 ACS on STN
 AN 134:369018 HCA Full-text

TI Method for preparing **sulfur trioxide**, sulfuric acid, and oleum from sulfur dioxide

IN Menon, Adam V.

PA Monsanto Company, USA

SO PCT Int. Appl., 67 pp.
 CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|---------------|------|----------|-----------------|--------------|
| PI | WO 2001036324 | A1 | 20010525 | WO 2000-US30095 | 200011 01 |

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 CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH,
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
 LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ,
 PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ,
 UA, UG, US, UZ, VN, YU, ZA, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD,
 TG

CA 2387988 A1 20010525 CA 2000-2387988
 200011
01

BR 2000015265 A 20020618 BR 2000-15265
200011
01

EP 1230150 A1 20020814 EP 2000-975531
200011
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
 PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
JP 2003517419 T 20030527 JP 2001-538282 200011
 01

| | | | | | |
|----------------|---|----------|----------------|-----|--------|
| ZA 2002002425 | A | 20030626 | ZA 2002-2425 | <-- | 200203 |
| MX 2002PA04408 | A | 20020902 | MX 2002-PA4408 | <-- | 200204 |
| | | | | | 26 |
| | | | | | 30 |

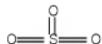
PRAI US 1999-163061P P 19991101 <--
WO 2000-US30095 W 20001101 <--

OS MARPAT 134:369018

AB A converted feed gas comprising a first portion of the SO₂-enriched stripper gas is formed. A conversion gas comprising SO₃ and residual SO₂ is formed by passing the converted feed gas through a plurality of catalyst beds in series, the plurality comprising at least 2 and no greater than 4 catalyst beds. A second portion of the SO₂-enriched gas is introduced into at least one catalyst bed which is downstream of the most upstream catalyst bed in the plurality to fortify the SO₂ concn. in the gas fed to the downstream bed. The present invention is also directed to a process for making sulfuric acid and/or oleum from a source gas comprising SO₂. A conversion gas comprising SO₃ and residual SO₂ is formed by passing the SO₂-enriched stripper gas through a plurality of catalyst beds in series. The conversion gas is combined with water vapor to form an acid product gas comprising: (a) sulfuric acid formed by a gas phase reaction between SO₃ from the conversion gas and water vapor, thereby generating the heat of formation of sulfuric acid in the gas phase; (b) SO₃; and (c) SO₂. Heat energy from the gas phase heat of formation of sulfuric acid is recovered by transfer of heat from the acid product gas to steam or feed water in an indirect heat exchanger. The cooled acid product gas is then contacted with liq.

sulfuric acid in an SO₃ absorption zone to form addnl. sulfuric acid and/or oleum and an SO₃-depleted gas comprising SO₂.

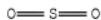
IT 7446-11-9P, Sulfur trioxide, preparation
7664-93-9P, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(method for prepg. sulfur trioxide, sulfuric acid, and oleum from sulfur dioxide)
RN 7446-11-9 HCA
CN Sulfur trioxide (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,
Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(method for prepg. sulfur trioxide, sulfuric acid, and oleum from sulfur dioxide)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)



IC ICM C01B017-765
CC 49-2 (Industrial Inorganic Chemicals)
Section cross-reference(s): 48
ST sulfur trioxide sulfuric acid oleum prepn sulfur
dioxide
IT Catalysts
Formation enthalpy
Heat exchangers
Heat transfer
Oxidation catalysts
(method for prep. sulfur trioxide, sulfuric
acid, and oleum from sulfur dioxide)
IT Heat
(recovery; method for prep. sulfur trioxide,
sulfuric acid, and oleum from sulfur dioxide)
IT 1314-62-1, Vanadium pentoxide, uses
RL: CAT (Catalyst use); USES (Uses)
(K-promoted; method for prep. sulfur trioxide
, sulfuric acid, and oleum from sulfur dioxide)
IT 7440-09-7, Potassium, uses
RL: CAT (Catalyst use); USES (Uses)
(V205 promoted with; method for prep. sulfur
trioxide, sulfuric acid, and oleum from sulfur dioxide)
IT 7446-11-9P, Sulfur trioxide, preparation
7664-93-9P, Sulfuric acid, preparation 8014-95-7P, Oleum
RL: IMF (Industrial manufacture); PREP (Preparation)
(method for prep. sulfur trioxide, sulfuric
acid, and oleum from sulfur dioxide)
IT 7446-09-5, Sulfur dioxide, reactions 7704-34-9, Sulfur,
reactions 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(method for prep. sulfur trioxide, sulfuric
acid, and oleum from sulfur dioxide)
IT 78-46-6, Dibutyl butyl phosphonate 4353-28-0, Tetraethylene glycol
diethyl ether
RL: TEM (Technical or engineered material use); USES (Uses)
(method for prep. sulfur trioxide, sulfuric
acid, and oleum from sulfur dioxide)
IT 7631-86-9, Silica, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use);
USES (Uses)
(support; method for prep. sulfur trioxide,
sulfuric acid, and oleum from sulfur dioxide)
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 133:82778 HCA Full-text
TI In situ chemical generator and method for using it to fabricate
semiconductor devices

IN Bar-Gadda, Ronny
PA Ronal Systems Corporation, USA
SO PCT Int. Appl., 25 pp.
CODEN: PIXXD2

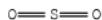
DT Patent

LA English

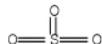
FAN.CNT 3

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|---|------|----------|------------------|--------------|
| PI | WO 2000040776 | A1 | 20000713 | WO 2000-US231 | 200001 04 |
| | | | | | <-- |
| | W: JP, KR, SG | | | | |
| | RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE | | | | |
| | US 6579805 | B1 | 20030617 | US 1999-225922 | 199901 05 |
| | | | | | <-- |
| | TW 439105 | B | 20010607 | TW 2000-89100067 | 200001 04 |
| | | | | | <-- |
| | EP 1155164 | A1 | 20011121 | EP 2000-902332 | 200001 04 |
| | | | | | <-- |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI | | | | |
| | JP 2002534787 | T | 20021015 | JP 2000-592468 | 200001 04 |
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| | KR 755122 | B1 | 20070904 | KR 2001-708564 | 200107 05 |
| | | | | | <-- |
| | US 20030170153 | A1 | 20030911 | US 2003-336483 | 200301 03 |
| | | | | | <-- |
| | US 6800559 | B2 | 20041005 | | |

PRAI US 1999-225922 A 19990105 <--
WO 2000-US231 W 20000104 <--
AB Chem. generator and method for generating a chem. species at a point of use such as the chamber of a reactor in which a workpiece such as a semiconductor wafer is to be processed. The species is generated by creating free radicals, and combining the free radicals to form the chem. species at the point of use.
IT 7446-09-5, Sulfur dioxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(SO₃ formation from SO₂)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



IT 7446-11-9P, Sulfur oxide (SO₃), preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(SO₃ formation from SO₂)
RN 7446-11-9 HCA
CN Sulfur trioxide (CA INDEX NAME)



IT 7664-93-9P, Sulfuric acid, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(chem. generation of)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(formation of nitric oxide from)

RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)

0==0

IC ICM C23F001-02
IC S H01L021-3065
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 48
IT 7446-09-5, Sulfur dioxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(SO₃ formation from SO₂)
IT 7446-11-9B, Sulfur oxide (SO₃), preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(SO₃ formation from SO₂)
IT 7631-86-9P, Silica, preparation 7647-01-0P, Hydrogen chloride,
preparation 7664-39-3P, Hydrogen fluoride, preparation
7664-93-9B, Sulfuric acid, preparation 7697-37-2P, Nitric
acid, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(chem. generation of)
IT 7727-37-9, Nitrogen, reactions 7782-44-7, Oxygen,
reactions 10102-44-0, Nitrogen dioxide, reactions 12385-13-6,
Atomic hydrogen, reactions 17778-88-0, Atomic nitrogen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(formation of nitric oxide from)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 6 OF 16 HCA COPYRIGHT 2008 ACS on STN
AN 128:259056 HCA Full-text
OREF 128:51259a,51262a
TI Environmentally safe process for the production of sulfuric acid
AU Kobayakov, A. I.; Kobyakov, A. A.
CS Ufa State Univ. Petroleum Engineering, Ufa, Russia
SO Theoretical Foundations of Chemical Engineering (Translation of
Teoreticheskie Osnovy Khimicheskoi Tekhnologii) (1998),
32(2), 182-189
CODEN: TFCEAU; ISSN: 0040-5795
PB MAIK Nauka/Interperiodica Publishing
DT Journal
LA English
AB A process flow sheet for the prodn. of sulfuric acid with waste gas
recycling is analyzed. Operations of the closed system are studied

by a computational expt. New methods of recovering sulfur dioxide from waste gases are described.

IT 7664-93-9P, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(environmentally safe process for sulfuric acid prodn.)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,
Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(environmentally safe process for sulfuric acid prodn.)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)



CC 49-2 (Industrial Inorganic Chemicals)
Section cross-reference(s): 48, 59
IT Absorption
Environmental pollution
Oxidation
Waste gases
(environmentally safe process for sulfuric acid prodn.)
IT 7664-93-9P, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(environmentally safe process for sulfuric acid prodn.)
IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,

Oxygen, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(environmentally safe process for sulfuric acid prodn.)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 7 OF 16 HCA COPYRIGHT 2008 ACS on STN

AN 128:3404 HCA Full-text

OREF 128:739a,742a

TI Kinetic modeling of the photooxidation of dimethyl disulfide in the liquid phase

AU Robert-Banchereau, Evelyne; Lacombe, Sylvie; Ollivier, Jean; Micheau, Jean Claude; Lavabre, Dominique

CS Laboratoire de Physico-Chimie Moleculaire, UMR 5624, University of PAU, Pau, F-64000, Fr.

SO International Journal of Chemical Kinetics (1997), 29(11), 825-834

CODEN: IJCKBO; ISSN: 0538-8066

PB Wiley

DT Journal

LA English

AB A reaction mechanism for the photooxidn. of di-Me disulfide (DMDS) in aq. acetonitrile has been established by kinetic modeling the UV absorbance vs. time curves under continuous irradn. The model, built according to the known soln. reactivity of oxysulfur radicals [1], consists of 22 steps involving 6 radical and 10 nonradical species. The first steps of the mechanism are the homolytic cleavage of the DMDS S-S bond with formation of methanethiyl radicals (CH₃S.) followed by addn. of these radicals to mol. oxygen. There are photoequil. between thiyl (CH₃S.) sulfinyl (CH₃SO[·]) and sulfonyl (CH₃SO₂[·]) radicals and the corresponding mol. species (Me methanethiosulfinate CH₃S(O)SCH₃ or MMTSI, Me methanethiosulfonate CH₃S(O)2SCH₃ or MMTS and methanesulfinic acid CH₃S(O)OH or MSIA) which appear as long lived intermediates. Reactions of sulfonyl radicals with oxygen lead to methanesulfonic acid (CH₃S(O)2OH) or MSA. Cleavage of sulfonyl radicals gives SO₂ and CH₃. the parent compds. of sulfuric (H₂SO₄) and methanoic (HCOOH) acids. The predictive power of the model was tested at higher initial concn. of DMDS in anhyd. and aq. acetonitrile. In these conditions, the proposed mechanism gives a semiquant. description of the course of the reaction and reproduces the kinetic behavior of the long lived intermediates.

IT 7446-09-5, Sulfur dioxide, reactions

RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); PROC (Process); RACT (Reactant or reagent)

(kinetic modeling of photooxidn. of di-Me disulfide in the liq. phase)

RN 7446-09-5 HCA

CN Sulfur dioxide (CA INDEX NAME)

O=S=O

IT 7782-44-7, Oxygen, reactions

RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(kinetic modeling of photooxidn. of di-Me disulfide in the liq. phase)

RN 7782-44-7 HCA

CN Oxygen (CA INDEX NAME)

O=O

IT 7664-93-9F, Sulfuric acid, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(kinetic modeling of photooxidn. of di-Me disulfide in the liq. phase)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



CC 22-7 (Physical Organic Chemistry)

IT 50-00-0, Methanal, reactions 75-75-2, Methanesulfonic acid 2229-07-4, Methyl radical 2949-92-0 4853-80-9, Methylsulfonyl radical 7175-75-9, Methylthio radical 7446-09-5, Sulfur dioxide, reactions 13882-12-7, Methyl methanethiosulfinate 17696-73-0, Methanesulfinic acid 25683-64-1, Methylsulfinyl radical

RL: FMU (Formation, unclassified); PEP (Physical, engineering or

chemical process); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); PROC (Process); RACT (Reactant or reagent)

(kinetic modeling of photooxidn. of di-Me disulfide in the liq. phase)

IT 624-92-0, Dimethyl disulfide 7782-44-7, Oxygen, reactions

RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(kinetic modeling of photooxidn. of di-Me disulfide in the liq. phase)

IT 64-18-6P, Formic acid, preparation 7664-93-9P, Sulfuric acid, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(kinetic modeling of photooxidn. of di-Me disulfide in the liq. phase)

RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 8 OF 16 HCA COPYRIGHT 2008 ACS on STN

AN 125:237192 HCA Full-text

OREF 125:44024a

TI Method of generating sulfuric acid mist and apparatus therefor

IN Inoe, Shigeru; Yamashita, Koichi; Ootsuki, Takashi

PA Toyota Motor Co Ltd, Japan; Besuto Sotsuki Kk

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|------|-----------------|------|
|------------|------|------|-----------------|------|

PI JP 08178911 A 19960712 JP 1994-318396

199412

21

<--

JP 3234424 B2 20011204

PRAI JP 1994-318396 19941221 <--

AB The process comprises a mixing a SO₂ gas and an O₂ gas contg. moisture, heating the gas mixt., contacting an oxidn. catalyst to generate a predetd. concn. of sulfuric acid mist. Moisture is supplied by using a bubbler. The SO₂ and O₂ gas flows are controlled by mass flow controllers, resp. The process is used for checking accuracy of a SOSX analyzer.

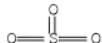
IT 7446-11-9P, Sulfur trioxide, reactions

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP

(Preparation); RACT (Reactant or reagent)
(method of generating sulfuric acid mist and app. therefor)

RN 7446-11-9 HCA

CN Sulfur trioxide (CA INDEX NAME)



IT 7664-93-9P, Sulfuric acid, uses

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(method of generating sulfuric acid mist and app. therefor)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,

Oxygen, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(method of generating sulfuric acid mist and app. therefor)

RN 7446-09-5 HCA

CN Sulfur dioxide (CA INDEX NAME)



RN 7782-44-7 HCA

CN Oxygen (CA INDEX NAME)



IC ICM G01N031-00

ICS G01N001-00

CC 80-7 (Organic Analytical Chemistry)
IT 7446-11-9P, Sulfur trioxide, reactions
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(method of generating sulfuric acid mist and app. therefor)
IT 7664-93-9B, Sulfuric acid, uses
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method of generating sulfuric acid mist and app. therefor)
IT 7446-09-5, Sulfur dioxide, reactions 7732-18-5, Water, reactions 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(method of generating sulfuric acid mist and app. therefor)

L25 ANSWER 9 OF 16 HCA COPYRIGHT 2008 ACS on STN
AN 123:238719 HCA Full-text
OREF 123:42447a, 42450a
TI Deactivation and compound formation in sulfuric acid catalysts and model systems
AU Eriksen, K. M.; Karydis, D. A.; Boghosian, S.; Fehrmann, R.
CS Chemistry Department A, The Technical University of Denmark, Lyngby, DK-2800, Den.
SO Journal of Catalysis (1995), 155(1), 32-42
CODEN: JCTLA5; ISSN: 0021-9517
PB Academic
DT Journal
LA English
AB The catalytic deactivation and the simultaneous formation of compds. in industrial sulfuric acid catalysts and their molten salt-gas model systems M2S207/V205-SO2/02/SO3/N2 (M = Na, K, Cs) have been studied by combined activity measurements and in situ ESR spectroscopy at temps. up to 500°C. The applied gas compns. were unconverted, and 50 and 90% preconverted std. feed gas contg. 10% SO₂, 11% O₂, and 79% N₂. This covers the conditions of all beds in an industrial SO₂ converter, without interstage absorption of SO₃. The temp. of deactivation was shown to decrease with increased degree of preconversion of the feed gas, increased mixing of the alkali promoters, and decreased vanadium content in the catalysts and model systems. The pptn. of V(III), V(IV), and mixed valence V(IV)-V(V) compds. was obsd. below the onset temp. of the catalyst deactivation. The salts have been isolated under operating conditions from model melts and identified by microscopy and spectroscopic methods. The V(IV) compds. were characterized by ESR spectroscopy and their temp. of decompn. was found to be in the range 450-500°C. Based on the characteristic ESR spectra, the V(IV) compds. causing the deactivation of working industrial catalysts could be identified in situ. Finally, it was found that the restoration of deactivated

catalysts requires heating to around 500°C, where the low-valence vanadium compds. decomp. and reoxidize to V(V).

IT 7664-93-9E, Sulfuric acid, preparation

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(deactivation and compd. formation in sulfuric acid catalysts and model systems)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions 7446-11-9, Sulfur trioxide, reactions 7782-44-7,

Oxygen, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(deactivation and compd. formation in sulfuric acid catalysts and model systems)

RN 7446-09-5 HCA

CN Sulfur dioxide (CA INDEX NAME)



RN 7446-11-9 HCA

CN Sulfur trioxide (CA INDEX NAME)



RN 7782-44-7 HCA

CN Oxygen (CA INDEX NAME)



CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 49
IT 7664-93-9P, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(deactivation and compd. formation in sulfuric acid catalysts and model systems)
IT 7446-09-5, Sulfur dioxide, reactions 7446-11-9,
Sulfur trioxide, reactions 7782-44-7,
Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(deactivation and compd. formation in sulfuric acid catalysts and model systems)

L25 ANSWER 10 OF 16 HCA COPYRIGHT 2008 ACS on STN

AN 123:87456 HCA Full-text

OREF 123:15565a,15568a

TI Process for recovering sulfuric acid from sulfate-containing used acid

IN Lailach, Guenter Dr

PA Bayer A.-G., Germany

SO Ger. Offen., 6 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------------|------|-------|-----------------|-------|
| | ----- | ---- | ----- | ----- | ----- |

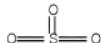
| | | | | | |
|----|------------|-------|----------|-----------------|--------------|
| PI | DE 4437550 | A1 | 19950504 | DE 1994-4437550 | 199410 20 |
| | ----- | ----- | ----- | ----- | <-- |

| | | | | |
|------|-----------------|----|----------|-----|
| PRAI | DE 1994-4437550 | A1 | 19941020 | <-- |
| | DE 1993-4337010 | | 19931029 | <-- |

AB In this process, comprising increasing the H₂SO₄ concn. to 50-75% by evapn., crystg. and removing the sulfates, thermally decompg. the moist sulfates oxides and SO₂-contg. gases, cooling the SO₂-contg. gases and oxides to 270-320°, dedusting the SO₂-contg. hot gases, scrubbing and cooling the SO₂-contg. dust-free gases to 25-40°, sepg. mist from the gases, drying the gases with 95-98% H₂SO₄, converting the SO₂-contg. gases with O to SO₃, and absorbing the SO₃ to obtain H₂SO₄, the dedusted SO₂- and 7-20-vol.% water vapor-contg. hot gases are scrubbed and cooled with 60-80-wt.% H₂SO₄ of 120-160° that is recirculated through a heat exchanger, and cooled to 25-40° by direct

or indirect heat exchange with a cooling liq., such that the heat from the SO₂-contg. hot gases is transferred to the sulfate-contg. used acid.

IT 7446-11-9P, Sulfur trioxide, preparation
RL: PNU (Preparation, unclassified); PREP (Preparation)
(sulfuric acid recovery from sulfate-contg. used acid)
RN 7446-11-9 HCA
CN Sulfur trioxide (CA INDEX NAME)



IT 7446-09-5P, Sulfur dioxide, preparation
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(sulfuric acid recovery from sulfate-contg. used acid)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



IT 7664-93-9P, Sulfuric acid, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(sulfuric acid recovery from sulfate-contg. used acid)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfuric acid recovery from sulfate-contg. used acid)
RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)

0==0

IC ICM C01B017-90
ICS C01B017-88; C01B017-76
CC 49-1 (Industrial Inorganic Chemicals)
IT 7446-11-9P, Sulfur trioxide, preparation
RL: PNU (Preparation, unclassified); PREP (Preparation)
(sulfuric acid recovery from sulfate-contg. used acid)
IT 7446-09-5P, Sulfur dioxide, preparation
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(sulfuric acid recovery from sulfate-contg. used acid)
IT 7664-93-9P, Sulfuric acid, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(sulfuric acid recovery from sulfate-contg. used acid)
IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfuric acid recovery from sulfate-contg. used acid)

L25 ANSWER 11 OF 16 HCA COPYRIGHT 2008 ACS on STN
AN 122:191601 HCA Full-text
OREF 122:35029a,35032a
TI Relation between conversion efficiencies and oxygen/sulfur dioxide
ratios in 3 + 2-type two-fold conversion
AU Zhang, Chaolin
CS Nanhua (Group) Co. Res. Inst., Peop. Rep. China
SO Liusuan Gongye (1994), (2), 10-16, 60
CODEN: LIGOEH
PB Liusuan Gongye Bianjibu
DT Journal
LA Chinese
AB A math. model for conversion efficiencies and O₂/S₀₂ ratios of 3 + 2
interpass absorption process was established on the basis of tests in
a 20 k tons/yr H₂S₀₄ pilot plant. The regression and residual error
anal. showed that the calcd. results were in good agreement with
exptl. data. In 3 + 2 interpass absorption configuration, an overall
conversion efficiency of ≥99.7% can be reached, provided that O₂/S₀₂
ratio is ≥0.766 no matter what kinds of pyrite supplies are used. In
other words, H₂S₀₄ output can be raised with the same conversion
efficiency by roasting high-grade pyrite which contains fewer O₂-
consuming impurities to increase inlet S₀₂ concn. when O₂/S₀₂ ratio
remains unchanged. The test showed that the overall conversion
efficiency is also related to process arrangement. At the same

O2/SO2 ratio, the conversion efficiency order is 3 + 2 > 3 + 1 > 2 + 2. At less O2/SO2 ratio, the difference is more evident.

IT 7664-93-9E, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(relation between conversion efficiencies and oxygen/sulfur dioxide ratios in 3 + 2-type two-fold conversion)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,
Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(relation between conversion efficiencies and oxygen/sulfur dioxide ratios in 3 + 2-type two-fold conversion)

RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)



CC 49-2 (Industrial Inorganic Chemicals)
IT 7664-93-9E, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(relation between conversion efficiencies and oxygen/sulfur dioxide ratios in 3 + 2-type two-fold conversion)

IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,
Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(relation between conversion efficiencies and oxygen/sulfur

dioxide ratios in 3 + 2-type two-fold conversion)

L25 ANSWER 12 OF 16 HCA COPYRIGHT 2008 ACS on STN
AN 108:228094 HCA [Full-text](#)
OREF 108:37321a, 37324a
TI Corrosion by photochemical reaction due to synchrotron radiation in TRISTAN accumulation ring
AU Momose, Takashi; Ishimaru, Hajime
CS Natl. Lab. for High Energy Phys., Tsukuba, Japan
SO Shinku (1988), 31(1), 18-20
CODEN: SHINAM; ISSN: 0559-8516
DT Journal
LA Japanese
AB Corrosion of Al alloy in the TRISTAN accumulation ring (TAR) is caused by HNO₃ and H₂SO₄ formed by the synchrotron radiation irradn. of the N, O, SO₂ in air and resulted in the formation of NO, NO₂, and SO₃ which then reacted with moisture to form HNO₃ and H₂SO₄. The humidity in the TAR was 60%. Controlling the humidity might be a way of controlling corrosion.
IT 7664-93-9P, preparation
RL: PREP (Preparation)
(formation and corrosion of aluminum alloy by, in accelerator accumulation ring in presence of synchrotron radiation)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7446-11-9P, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in accelerator accumulation ring, aluminum alloy corrosion in relation to)
RN 7446-11-9 HCA
CN Sulfur trioxide (CA INDEX NAME)



IT 7446-09-5, reactions 7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(radiolysis of, by synchrotron radiation in accelerator
accumulation ring, aluminum alloy corrosion in relation to)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)

O==S==O

RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)

O==O

CC 71-1 (Nuclear Technology)
Section cross-reference(s): 74
IT 7664-93-9P, preparation 7697-37-2P, preparation
RL: PREP (Preparation)
(formation and corrosion of aluminum alloy by, in accelerator
accumulation ring in presence of synchrotron radiation)
IT 7446-11-9P, preparation 10102-43-9P, preparation
10102-44-0P, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in accelerator accumulation ring, aluminum alloy
corrosion in relation to)
IT 7446-09-5, reactions 7727-37-9, reactions
7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(radiolysis of, by synchrotron radiation in accelerator
accumulation ring, aluminum alloy corrosion in relation to)

L25 ANSWER 13 OF 16 HCA COPYRIGHT 2008 ACS on STN

AN 105:216541 HCA Full-text

OREF 105:34773a,34776a

TI Conversion of sulfur dioxide to sulfur trioxide
facilitated by in situ UV photolysis of formaldehyde and sulfur
dioxide in an oxygen matrix at 12 K

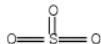
AU Green, Martina; Lee, Edward K. C.

CS Dep. Chem., Univ. California, Irvine, CA, 92717, USA

SO Journal of Physical Chemistry (1986), 90(24), 6470-5

CODEN: JPCHAX; ISSN: 0022-3654

DT Journal
LA English
AB The photooxidn. product distributions from photolyses of H₂CO and H₂CO₂SO₂ mol. complexes in O matrixes at $\lambda = 270-420$ nm are compared. Photodissocn. of H₂CO produced RO₂ species (HO₂ and HC(O)OO radicals) which then efficiently oxidized SO₂ to SO₃ (and H₂SO₄). This process occurred with an efficiency of .apprx.0.7 ± 0.3 per H₂CO₂SO₂ mol. complex photodissocd. Various photooxidn. mechanisms are considered. Implications of the low-temp./matrix photooxidn. results on atm. photooxidn. of SO₂ by RO₂ species are discussed.
IT 7446-11-9P, preparation 7664-93-9P, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in photolysis of oxygen matrix contg. sulfur dioxide and formaldehyde)
RN 7446-11-9 HCA
CN Sulfur trioxide (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(photolysis of matrix from, contg. sulfur dioxide and formaldehyde)
RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)



IT 7446-09-5, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(photolysis of, in oxygen matrix contg. formaldehyde)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)

O=S=O

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
IT 3170-83-0P 7446-11-9P, preparation 7664-93-9P,
preparation 56240-83-6P
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in photolysis of oxygen matrix contg. sulfur
dioxide and formaldehyde)
IT 7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(photolysis of matrix from, contg. sulfur dioxide and
formaldehyde)
IT 7446-09-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(photolysis of, in oxygen matrix contg. formaldehyde)

L25 ANSWER 14 OF 16 HCA COPYRIGHT 2008 ACS on STN

AN 89:8407 HCA Full-text

OREF 89:1383a,1386a

TI Sulfuric acid manufacture using dispersed asbestos

IN Iida, Akira

PA Taniguchi, Akira, Japan

SO Jpn. Tokyo Koho, 8 pp.

CODEN: JAXXAD

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---------------|------|----------|-----------------|--------------|
| PI | JP 52030160 | B | 19770805 | JP 1973-68298 | 197306 19 |
| | JP 50018385 | A | 19750226 | | <-- |
| PRAI | JP 1973-68298 | | 19730619 | <-- | |

AB H₂SO₄ in manufd. by bubbling a SO₂-contg. gas into an aq. suspension of asbestos (contg. large amts. of adsorbed O), heating the suspension to 70-100°, then filtering off the asbestos.
IT 7664-93-9P, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of, sulfur dioxide oxidn. by oxygen absorbed on asbestos in)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. by asbestos-absorbed, of sulfur dioxide)
RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)



IT 7446-09-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. of, by oxygen absorbed on asbestos)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



IC C01B017-74
CC 49-2 (Industrial Inorganic Chemicals)
IT Asbestos
RL: USES (Uses)
(absorption by, of oxygen for sulfur dioxide oxidn.)
IT 7664-93-9P, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)

(manuf. of, sulfur dioxide oxidn. by oxygen absorbed on asbestos in)

IT 7782-44-7, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidn. by asbestos-absorbed, of sulfur dioxide)

IT 7446-09-5, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidn. of, by oxygen absorbed on asbestos)

L25 ANSWER 15 OF 16 HCA COPYRIGHT 2008 ACS on STN
 AN 86:173661 HCA Full-text
 OREF 86:27283a,27286a

TI Preparation of sulfuric acid from 18-22% sulfur dioxide
 AU Epifanov, V. S.; Khryashchchev, S. V.; Terent'ev, D. F.; Borisov, V. M.; Popov, A. E.; Safonov, A. V.
 CS USSR
 SO Khimicheskaya Promyshlennost (Moscow, Russian Federation) (1977), (2), 122-4
 CODEN: KPRMAW; ISSN: 0023-110X
 DT Journal
 LA Russian
 AB The use of air with supplemental O in the manuf. of H₂SO₄ from gases contg. 18-22% SO₂ by the double contact-double absorption method. With supplemental O the energy consumption and equipment required were less than if no supplemental O was added. Also, as the SO₂ concn. increased these values decreased.
 IT 7664-93-9F, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (manuf. of, use of air plus oxygen in, energy consumption and equipment requirement redn. in)

RN 7664-93-9 HCA
 CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidn. of, use of air plus oxygen in, energy consumption and equipment requirements decrease by)

RN 7446-09-5 HCA
 CN Sulfur dioxide (CA INDEX NAME)

O=S=O

IT 7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of air and, with sulfur dioxide, energy consumption and
equipment requirement redn. by)
RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)

O=O

CC 49-2 (Industrial Inorganic Chemicals)
IT 7664-93-9P, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of, use of air plus oxygen in, energy consumption and
equipment requirement redn. in)
IT 7446-09-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. of, use of air plus oxygen in, energy consumption and
equipment requirements decrease by)
IT 7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of air and, with sulfur dioxide, energy consumption and
equipment requirement redn. by)

L25 ANSWER 16 OF 16 HCA COPYRIGHT 2008 ACS on STN
AN 84:22509 HCA Full-text
OREF 84:3683a,3686a
TI Kinetics of particle growth. VI. Sulfuric acid aerosol from the
photooxidation of sulfur dioxide in moist oxygen-nitrogen mixtures
AU Smith, Roland; De Pena, R. G.; Heicklen, Julian
CS Cent. Air Environ. Stud., Pennsylvania State Univ., University Park,
PA, USA
SO Journal of Colloid and Interface Science (1975), 53(2),
202-13
CODEN: JCISA5; ISSN: 0021-9797
DT Journal
LA English
AB SO₂ was photolyzed by fluorescent light at 29° in moist O-N mixts. of
1 atm pressure. The particle no. d. of the H₂SO₄ aerosol product was

monitored as a function of irradn. time. After 1-min induction period, particles were produced and they increased to a max. value, Nmax, of .apprx.0.6 + 105 particles/cm³ at .apprx.10 min irradn. time for an SO₂ photoremoval const. of 3 + 10⁻⁶ min⁻¹. The results were independent of the SO₂ pressure or the H₂O pressure, but Nmax was smaller at reduced light intensity. The crit. concn. of H₂SO₄ vapor needed to initiate particle growth was .apprx.109 mols./cm³ (2 + 10⁻⁷ torr). The nucleation mechanism is: SO₂ + hν → SO₂^{*}; SO₂^{*} + O₂ → SO₄; SO₄ + SO₂ → 2SO₃ (4); SO₃ + H₂O → H₂SO₄ (3); qSO₄ → (SO₄)_q (5); where SO₂^{*} is the electronically excited SO₂ mol. that is the precursor to SO₄. Reaction 5 is the nucleating reaction, and (SO₄)_q is the nucleating species. Reaction 5 is slow compared to reaction 4, and the steady-state approxn. leads to the law for the nucleation rate, R_{nuc} = k₅(k₁/k₄)q, where k₁ is the photoremoval rate of SO₂.

IT 7664-93-9E, properties

RL: PRP (Properties); PREP (Preparation)

(aerosols, kinetics of growth of, with formation by photooxidn. of sulfur dioxide)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(photochem. oxidn. of, in moist oxygen-nitrogen mixts. with formation of sulfuric acid aerosols)

RN 7446-09-5 HCA

CN Sulfur dioxide (CA INDEX NAME)



IT 7782-44-7, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(photooxidn. of sulfur dioxide in moist nitrogen and)

RN 7782-44-7 HCA

CN Oxygen (CA INDEX NAME)

0==0

CC 66-1 (Surface Chemistry and Colloids)
Section cross-reference(s): 74, 53
IT 7664-93-9F, properties
RL: PRP (Properties); PREP (Preparation)
(aerosols, kinetics of growth of, with formation by photooxidn.
of sulfur dioxide)
IT 7446-09-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(photochem. oxidn. of, in moist oxygen-nitrogen mixts. with
formation of sulfuric acid aerosols)
IT 7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(photooxidn. of sulfur dioxide in moist nitrogen and)

=> D L26 1-7 BIB ABS HITSTR HITIND

L26 ANSWER 1 OF 7 HCA COPYRIGHT 2008 ACS on STN
AN 133:60918 HCA Full-text
TI Waste gas analysis system and manufacture of sulfuric acid from
smelting waste gas using same.

IN Noda, Tsutomu; Kondo, Etsuo; Shinohara, Masahiko; Sato, Hiroshi
PA Sumitomo Metal Mining Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|---------------|------|----------|-----------------|--------------|
| | ----- | ---- | ----- | ----- | |
| | ----- | ---- | ----- | ----- | |
| PI | JP 2000191306 | A | 20000711 | JP 1998-369345 | 199812 25 |

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PRAI JP 1998-369345 19981225 <--
AB The title anal. system comprises an introduction piping connected
with the outlet of a booster blower, a gas purifn. device, a reducing
valve, a continuous automatic analyzer, and a discharge piping
connected to the inlet of a drying tower; the introduction piping and
the discharge piping are connected with the gas purifn. device resp.;

the gas purifn. device and the continuous automatic analyzer are connected via the reducing valve. The sulfuric acid manuf. process includes using the above stated anal. system to find SO₂ concn. and O₂ concn. in waste gas; if necessary, diln. air is added into waste gas for properly adjusting the ratio of SO₂ concn. and O₂ concn. in waste gas based on the anal. result.

IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,
Oxygen, reactions
RL: ANT (Analyte); RCT (Reactant); ANST (Analytical study);
RACT (Reactant or reagent)
(waste gas anal. system and manuf. of sulfuric acid from smelting
waste gas using same)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)

O=S=O

RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)

O=O

IT 7664-93-9P, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(waste gas anal. system and manuf. of sulfuric acid from smelting
waste gas using same)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IC ICM C01B017-765
ICS C01B017-74; G01N001-22; G01N031-00; G01N031-22
CC 49-3 (Industrial Inorganic Chemicals)
Section cross-reference(s): 55, 56, 59, 79

IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,
Oxygen, reactions
RL: ANT (Analyte); RCT (Reactant); ANST (Analytical study);
RACT (Reactant or reagent)
(waste gas anal. system and manuf. of sulfuric acid from smelting
waste gas using same)
IT 7664-93-9P, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(waste gas anal. system and manuf. of sulfuric acid from smelting
waste gas using same)

L26 ANSWER 2 OF 7 HCA COPYRIGHT 2008 ACS on STN

AN 132:224458 HCA Full-text
TI Sulfuric acid conversion process
IN Hakka, Leo E.; Parisi, Paul J.
PA Cansolv Technologies Inc., Can.
SO PCT Int. Appl., 34 pp.
CODEN: PIXXD2

DT Patent
LA English
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------|---------------|-------|----------|-----------------|--------------|
| ----- | ----- | ----- | ----- | ----- | ----- |
| PI | WO 2000014011 | A1 | 20000316 | WO 1999-CA796 | 199909 02 |

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W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CH, CN, CR, CU,
CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID,
IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,
LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE,
SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA,
ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE,
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ,
CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

CA 2246474 A1 20000303 CA 1998-2246474 199809
03

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AU 9954040 A1 20000327 AU 1999-54040 199909
02

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PRAI CA 1998-2246474 A 19980903 <--
US 1998-148852 A1 19980904 <--

WO 1999-CA796 W 19990902 <--

AB A process for prodn. of H₂SO₄ comprises (1) providing a H₂SO₄ precursor stream comprising O₂ and SO₂; (2) feeding the H₂SO₄ stream to a H₂SO₄ converter to produce a H₂SO₄ stream and a gaseous stream contg. unreacted SO₂; and (3) subjecting the gaseous stream to a regenerable SO₂ recovery process to obtain a SO₂-rich stream and a SO₂-lean stream.

IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,

Oxygen, reactions

RL: PEP (Physical, engineering or chemical process); RCT (Reactant);
PROC (Process); RACT (Reactant or reagent)
(in sulfuric acid manuf.)

RN 7446-09-5 HCA

CN Sulfur dioxide (CA INDEX NAME)

O=S=O

RN 7782-44-7 HCA

CN Oxygen (CA INDEX NAME)

O=O

IT 7664-93-9P, Sulfuric acid, preparation

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(manuf. of)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



IC ICM C01B017-76

CC 49-2 (Industrial Inorganic Chemicals)

IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,

Oxygen, reactions

RL: PEP (Physical, engineering or chemical process); RCT (Reactant);
PROC (Process); RACT (Reactant or reagent)
(in sulfuric acid manuf.)

IT 7664-93-9P, Sulfuric acid, preparation

RL: IMF (Industrial manufacture); PEP (Physical, engineering or
chemical process); PREP (Preparation); PROC (Process)
(manuf. of)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 3 OF 7 HCA COPYRIGHT 2008 ACS on STN

AN 128:283877 HCA Full-text

OREF 128:56179a,56182a

TI Photochemical process for the manufacture of methanesulfonic acid
from mixtures of acetic acid and sulfur dioxide and oxygen

IN Eiermann, Matthias; Papkalla, Thomas

PA BASF Aktiengesellschaft, Germany; Eiermann, Matthias; Papkalla,
Thomas

SO PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DT Patent

LA German

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------------|------|------|-----------------|------|
|--|------------|------|------|-----------------|------|

| | | | | | |
|----|------------|----|----------|----------------|--------------|
| PI | WO 9815527 | A1 | 19980416 | WO 1997-EP5536 | 199710 08 |
|----|------------|----|----------|----------------|--------------|

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W: CA, JP, MX, US

RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,
PT, SE

| | | | | |
|-------------|----|----------|------------------|--------------|
| DE 19641483 | A1 | 19980416 | DE 1996-19641483 | 199610 09 |
|-------------|----|----------|------------------|--------------|

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| | | | | |
|-----------|----|----------|----------------|--------------|
| EP 932599 | A1 | 19990804 | EP 1997-911197 | 199710 08 |
|-----------|----|----------|----------------|--------------|

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| | | | | |
|-----------------------|----|----------|----------------|--------------|
| EP 932599 | B1 | 20010822 | | |
| R: BE, DE, FR, GB, IT | | | | |
| JP 2001501942 | T | 20010213 | JP 1998-517181 | 199710 08 |

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US 6207025

B1

20010327

US 1999-269759

199904
08

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PRAI DE 1996-19641483 A 19961009 <--
WO 1997-EP5536 W 19971008 <--

AB Methanesulfonic acid is prepd. in high yield and selectivity by UV
irradn. of a mixt. contg. acetic acid, sulfur dioxide, and oxygen. An
accumulated irradn. d. of 240-320 nm light on the light-entrance
surface of the reaction mixt. of 0.05-50 nmole-quantum/cm²-h is used.

IT 7664-93-9, Sulfuric acid, preparation

RL: BYP (Byproduct); PREP (Preparation)
(photochem. process for the manuf. of methanesulfonic acid from
mixts. of acetic acid and sulfur dioxide and oxygen)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions 7782-44-7,
Oxygen, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(photochem. process for the manuf. of methanesulfonic acid from
mixts. of acetic acid and sulfur dioxide and oxygen)

RN 7446-09-5 HCA

CN Sulfur dioxide (CA INDEX NAME)



RN 7782-44-7 HCA

CN Oxygen (CA INDEX NAME)



IC ICM C07C303-14

ICS C07C309-04
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 23, 48, 74
 IT 7664-93-9P, Sulfuric acid, preparation
 RL: BYP (Byproduct); PREP (Preparation)
 (photochem. process for the manuf. of methanesulfonic acid from
 mixts. of acetic acid and sulfur dioxide and oxygen)
 IT 64-19-7, Acetic acid, reactions 7446-09-5, Sulfur dioxide,
 reactions 7782-44-7, Oxygen, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (photochem. process for the manuf. of methanesulfonic acid from
 mixts. of acetic acid and sulfur dioxide and oxygen)
 RE.CNT 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 4 OF 7 HCA COPYRIGHT 2008 ACS on STN
 AN 112:182365 HCA Full-text
 OREF 112:30813a,30816a
 TI Method and apparatus for the desulfurization of sulfur
 dioxide-containing gases under formation of sulfuric acid
 IN Lailach, Guenter; Gerken, Rudolf
 PA Bayer A.-G., Germany
 SO Ger. Offen., 4 pp.
 CODEN: GWXXBX
 DT Patent
 LA German
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|--|------|----------|-----------------|--------------|
| PI | DE 3826372 | A1 | 19900222 | DE 1988-3826372 | 198808 03 |
| | EP 356693 | A2 | 19900307 | EP 1989-113419 | 198907 21 |
| | EP 356693 | A3 | 19900321 | <-- | |
| PRAI | DE 1988-3826372 | A | 19880803 | <-- | |
| AB | In the title process, comprising reacting the SO ₂ with O and water on moistened, activated C at 40-90°, 7-100 g H ₂ O are nebulized per 1 g SO ₂ in the SO ₂ -contg. gases having a H ₂ O-vapor satn. of ≥90%. The app. consists of a vertical multicompartiment reactor having circular or rectangular cross-sectional area, in which the activated C beds are supported by gas-permeable supports, and in which the reactor | | | | |

wall above the beds contain openings for the introduction of the SO₂- and water droplet-contg. gas, and openings under the beds for the removal of the desulfurized gas and the H₂SO₄. This method and app. give improved utilization of the reactor vol. at decreased free space.

IT 7664-93-9B, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of, from sulfur dioxide in flue gases, by oxidn. on
moistened activated carbon, app. for)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. of, in flue gases, on moistened activated carbon, for
sulfuric acid, app. for)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. with, of sulfur dioxide, in flue gases, on moistened
activated carbon, for sulfuric acid, app. for)
RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)



IC ICM B01D053-34
ICS B01D053-14; C01B017-69
CC 49-2 (Industrial Inorganic Chemicals)

IT 7664-93-9F, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of, from sulfur dioxide in flue gases, by oxidn. on
moistened activated carbon, app. for)
IT 7446-09-5, Sulfur dioxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. of, in flue gases, on moistened activated carbon, for
sulfuric acid, app. for)
IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. with, of sulfur dioxide, in flue gases, on moistened
activated carbon, for sulfuric acid, app. for)

L26 ANSWER 5 OF 7 HCA COPYRIGHT 2008 ACS on STN

AN 111:236065 HCA Full-text

OREF 111:39187a,39190a

TI Apparatus for the manufacture of sulfuric acid by the contact
process

IN Ukawa, Naohiko; Nakamura, Tsumoru; Kotake, Shinichiro

PA Mitsubishi Heavy Industries, Ltd., Japan

SO Ger. Offen., 6 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---------------|------|----------|-----------------|--------------|
| PI | DE 3911889 | A1 | 19891019 | DE 1989-3911889 | 198904 07 |
| | | | | | |
| JP | 01257110 | A | 19891013 | JP 1988-84105 | 198804 07 |
| | | | | | |
| JP | 07108767 | B | 19951122 | | <-- |
| AU | 8932428 | A | 19891012 | AU 1989-32428 | 198904 04 |
| | | | | | |
| AU | 610374 | B2 | 19910516 | | <-- |
| CA | 1332783 | C | 19941101 | CA 1989-595960 | 198904 06 |
| | | | | | |
| PRAI | JP 1988-84105 | A | 19880407 | <-- | <-- |

AB The title app. comprises a piping system for supplying the SO₂ and O₂, contg. multiple honeycomb-type grids of catalytic material having equiv. diam. 3.0-15.0 mm and open vol. 30-70%, sep'd. by heat exchangers. The app. has low pressure drop.

IT 7664-93-9P, Sulfuric acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of, app. for, with honeycomb-type catalyst grids)

RN 7664-93-9 HCA

CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, Sulfur dioxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with oxygen, honeycomb-type catalyst grids for, in sulfuric acid manuf.)

RN 7446-09-5 HCA

CN Sulfur dioxide (CA INDEX NAME)



IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with sulfur dioxide, honeycomb-type catalyst grids for, in sulfuric acid manuf.)

RN 7782-44-7 HCA

CN Oxygen (CA INDEX NAME)



IC ICM C01B017-76
ICS B01J035-04

CC 49-2 (Industrial Inorganic Chemicals)
Section cross-reference(s): 47

IT 7664-93-9P, Sulfuric acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of, app. for, with honeycomb-type catalyst grids)
IT 7446-09-5, Sulfur dioxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with oxygen, honeycomb-type catalyst grids for, in
sulfuric acid manuf.)
IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with sulfur dioxide, honeycomb-type catalyst grids
for, in sulfuric acid manuf.)

L26 ANSWER 6 OF 7 HCA COPYRIGHT 2008 ACS on STN
AN 105:234486 HCA Full-text
OREF 105:37745a,37748a
TI The study of the sulfur dioxide conversion for the sulfuric
acid-hydrogen production process
AU Stankovic, Z. D.
CS Fac. Eng. Bor, Univ. Beograd, Bor, 19210, Yugoslavia
SO Advances in Hydrogen Energy (1986), 5(Hydrogen Energy
Prog. 6, Vol. 1), 394-405
CODEN: AHENDB; ISSN: 0276-2412
DT Journal
LA English
AB The results of the depolarization effect of the anodic oxidn. of SO₂
by O generated at packed bed electrodes on the process of
electrolysis of H₂O for prodn. of H and H₂SO₄ are presented. By
using potential-time and current-potential measurements, the extent
of the depolarization effect of SO₂ on the anodic potential of the
H₂O electrolyzer was obtained.
IT 7446-09-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. of, electrochem., in sulfuric acid-hydrogen prodn.
process)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)

O=S=O

IT 7664-93-9P, preparation
RL: PREP (Preparation)
(prodn. of, by sulfur dioxide conversion in hydrogen prodn.
process)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7782-44-7, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfur dioxide anodic oxidn. by, in sulfuric acid-hydrogen
 prodn. process)
 RN 7782-44-7 HCA
 CN Oxygen (CA INDEX NAME)

0=O

CC 72-9 (Electrochemistry)
 IT 7446-09-5, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidn. of, electrochem., in sulfuric acid-hydrogen prodn.
 process)
 IT 7664-93-9P, preparation
 RL: PREP (Preparation)
 (prodn. of, by sulfur dioxide conversion in hydrogen prodn.
 process)
 IT 7782-44-7, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfur dioxide anodic oxidn. by, in sulfuric acid-hydrogen
 prodn. process)

L26 ANSWER 7 OF 7 HCA COPYRIGHT 2008 ACS on STN

AN 95:105177 HCA Full-text

OREF 95:17533a,17534a

TI Electrogenerative oxidation of sulfur dioxide

AU Spotnitz, R. M.; Loeffler, C. E., II; Langer, S. H.

CS Dep. Chem. Eng., Univ. Wisconsin-Madison, Madison, WI, 53706, USA

SO Journal of Applied Electrochemistry (1981), 11(4), 403-5

CODEN: JAELBJ; ISSN: 0021-891X

DT Journal

LA English

AB Possible applications of electrosynthesis of H₂SO₄ from SO₂ and O are discussed, and preliminary results for a lab. scale reactor are

presented. The use of active, fuel-cell electrodes enables relatively large current densities to be obtained at low cell voltages.

IT 7664-93-9P, preparation
RL: PREP (Preparation)
(electrosynthesis of, from sulfur dioxide and oxygen)
RN 7664-93-9 HCA
CN Sulfuric acid (CA INDEX NAME)



IT 7446-09-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. of, electrogenerative)
RN 7446-09-5 HCA
CN Sulfur dioxide (CA INDEX NAME)



IT 7782-44-7, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfuric acid electrosynthesis from sulfur dioxide and)
RN 7782-44-7 HCA
CN Oxygen (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 49
IT 7664-93-9P, preparation
RL: PREP (Preparation)
(electrosynthesis of, from sulfur dioxide and oxygen)
IT 7446-09-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. of, electrogenerative)

IT 7782-44-7, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(sulfuric acid electrosynthesis from sulfur dioxide and)